Electrofishing Survey for Brunzell Slough, Upper Ruby River Watershed

September 27, 2001

Prepared for:

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Introduction

Brunzell Slough is a small tributary of the Ruby River located about ten miles above Ruby Reservoir in Madison County, Montana. Kingfisher Consulting retained the services of Confluence Consulting, Inc. to conduct an electrofishing survey of Brunzell Slough to determine composition of fish species in this stream. Specifically, our objective was to document presence or absence of game fish and species of special concern, which is a provision of a fish stocking permit being sought by the property owner. This work was completed under a scientific collectors permit issued by Montana Fish, Wildlife & Parks (Permit Number SCP-28-01).

Site Description

Brunzell Slough is small, meandering stream about 2 miles long. It has a narrow and relatively deep channel that is consistent with Rosgen's E channel type classification (Rosgen 1996). Banks are well vegetated with sedges, grasses, and rushes and undercut banks are a common habitat feature in this stream. Dense stands of willow (*Salix sp.*) and red-osier dogwood (*Cornus stolonifera*) are also present in patches. Galleries of mature cottonwood (*Populus sp.*) occur in the lower 1/3 of this stream. Flows in Brunzell Slough are augmented by water diverted from an irrigation ditch near its source. The introduction of these flows increases the potential of Brunzell Slough to harbor a fishery.

Methods

We sampled fish at three locations along the length of Brunzell Slough on September 21, 2001 (Table 1 and Figure 1). Carol Endicott, a fish biologist with Confluence was assisted by Chris Boyer of Kingfisher Consulting. Since the objective of the study was to determine species composition as opposed to calculating a population estimate, we designed the sampling scheme based on environmental monitoring and assessment protocols (EMAP) developed by the Environmental Protection Agency (EPA). EMAP pilot studies have suggested that a study reach length of 40 times the channel width is required to capture 90% of fish species present (Lazorchak et al 1998). With stream widths varying between four and ten feet on Brunzell Slough, we established study reaches of between 450 and 500 feet to maximize the probability of sampling all species present.

Table 1. *Latitude and longitude of lower end of sampling reaches on Brunzell Slough.*

Reach	Latitude	Longitude
1	45° 8' 9.2"	112° 8' 22.8"
2	45° 8' 1.0 "	112° 8' 11.4"
3	45° 7' 54.1"	112° 7' 58.8"

We sampled fish using a Smith-Root backpack electrofisher with smooth DC pulse in one pass per reach. Fish of all species were netted, however, efforts were decreased for mottled sculpin (*Cottus bairdi*) when it became apparent that they were very common. Elapsed shocking time was noted to determine catch per unit effort. Fish

were anesthetized using MS-222 to minimize the stress associated with handling and measuring. We identified each captured fish and recorded total length.

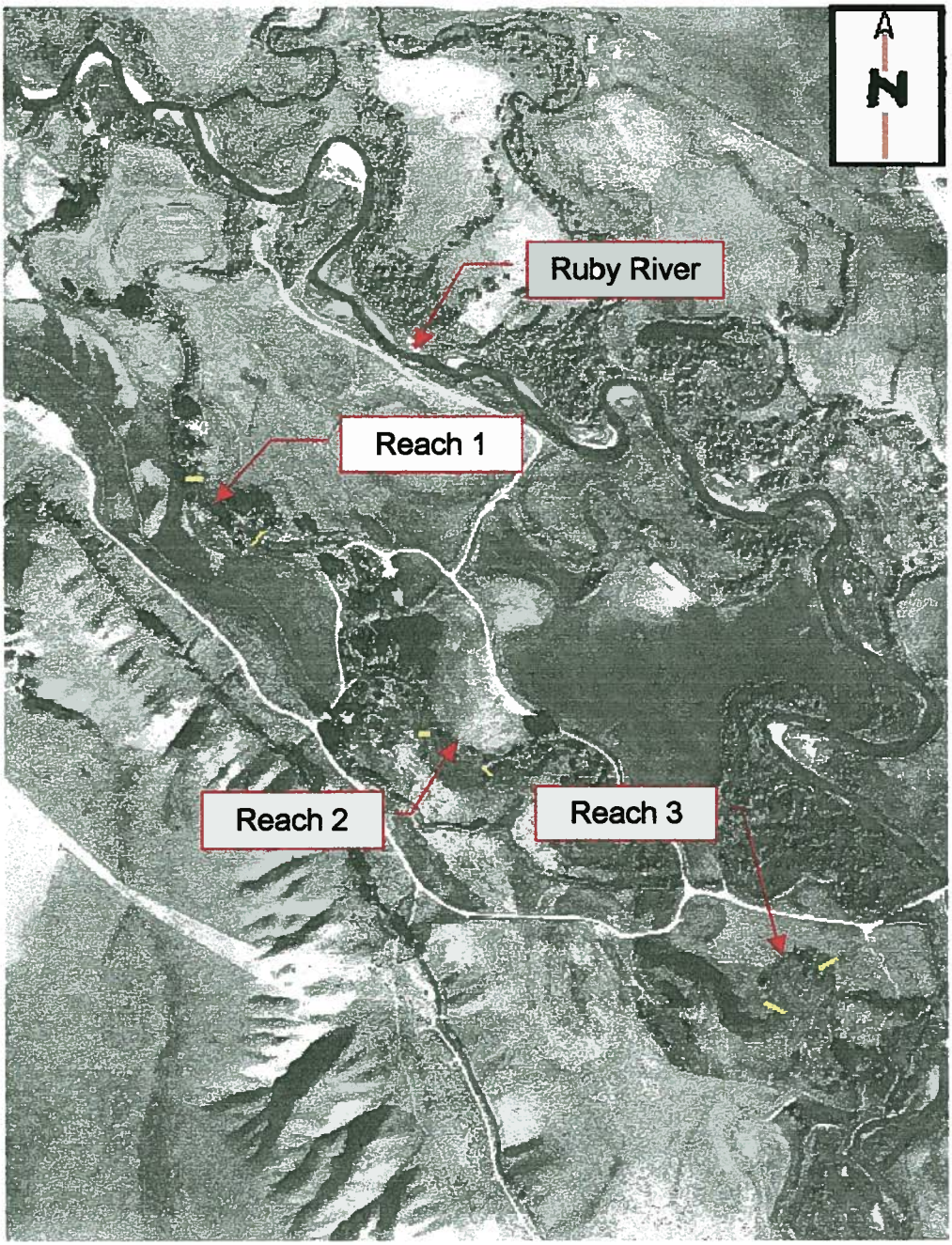


Figure 1. *Aerial view of fish sampling locations on Brunzell Slough.*

In addition to the fish survey, we made observations regarding species composition and relative abundance of reptiles and amphibians observed during sampling. Amphibian populations are declining worldwide and population trends of reptiles are poorly understood. Despite growing concerns, there are few resources available to monitor

these taxa. For these reasons, we documented observations of reptiles and amphibians as an aid in determining their distribution and status.

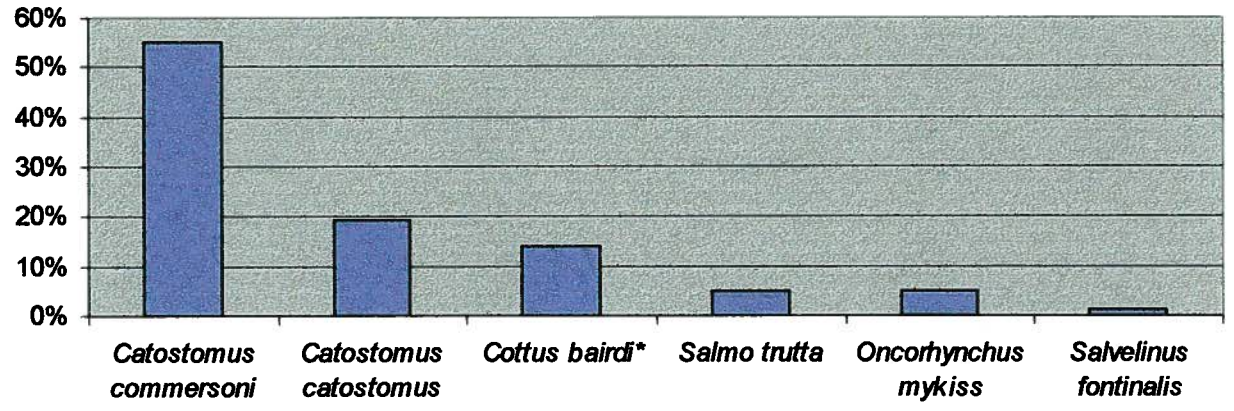
At the completion of field work, all equipment including waders, nets, and electrofishing unit were disinfected using a household disinfectant to minimize the spread of fish diseases.

Results

We captured a total of 78 fish of 6 different species within the three study reaches on Brunzell Slough (Figure 2 and Table 2). White sucker (*Catostomus commersoni*) was the most abundant species comprising about 55% of the total catch. Longnose sucker (*Catostomus catostomus*) was the second most prevalent species at 19% of total catch. Mottled sculpin (*Cottus bairdi*) comprised only 14% fish captured, however, this is an underestimate of their abundance as we exerted less effort in netting this species.

Game species were considerably less abundant than the non-game, native species described above. A total of four brown trout (*Salmo trutta*) ranging from 4.4 to 11.0 inches were captured among the three sections (Table 3 in Appendix). Four juvenile rainbow trout (*Oncorhynchus mykiss*) ranging between 2.2 and 2.8 inches were captured in Reach 3. Each of the rainbow trout demonstrated one or more symptoms of whirling disease including blackened tails, head and spinal deformities, and the characteristic spinning behavior. None of these fish survived the stress of capture and handling. Rather than returning infected fish tissue to the system, we retained these specimens and disinfected them with a strong bleach solution before disposal. Brook trout (*Salvelinus fontinalis*) was the most rare species with only one fish of this species captured.

Figure 2. *Percent relative abundance of fish species sampled in Brunzell Slough on September 21, 2001.*



* Sampling effort was decreased for this species due to high abundance. Actual percent abundance may be higher.

Table 2. *Numbers of fish captured in 450 to 500 foot sections of Brunzell Slough on September 21, 2001.*

	Effort		Species						
Reach	Length of Reach (feet)	Shocking Time (seconds)	Brook trout	Brown trout	Longnose sucker	Mottled sculpin	Rainbow trout	White sucker	Grand Total
1	450	556	1	1	4	3		23	32
2	450	806		1	11	5		12	29
3	500	1113		2		3	4	8	17
Total	**1400**	**2475**	**1**	**4**	**15**	**11**	**4**	**43**	**78**

Table 3. *Lengths of fish captured in Brunzell Slough on September 21, 2001.*

Species	Number of fish	Minimum length (inches)	Maximum length (inches)	Average Length (inches)
Brook trout	1	7.1	7.1	7.1
Brown trout	4	4.4	11	7.0
Longnose sucker	15	2.5	5.6	4.0
Mottled sculpin	11	1.4	3.4	2.6
Rainbow trout	4	2.2	2.8	2.6
White sucker	43	1.7	8.4	4.6

Two species of amphibian were observed in Brunzell Slough. Spotted frogs (*Rana pretiosa*) were common in all three reaches. A single toad was observed during electrofishing. Unfortunately, this specimen eluded capture preventing a positive identification. Based on known distributions of toads in Montana (Reichel and Flath 1995), this was presumably a western toad (*Bufo boreas*).

Conclusions

Brunzell Slough supports a fish assemblage comprised mostly of native, non-game species including white sucker, longnose sucker, and mottled sculpin. Low numbers of game fish species occur in Brunzell Slough including brown trout, rainbow trout, and brook trout. The dominance of trout populations by brown trout and rainbow trout is consistent with fish populations in lower reach habitats in the upper Ruby River (Oswald 2000).

A primary objective of this sampling effort was to determine presence or absence of species of special concern. Potential species of special concern in this area are westslope cutthroat trout (*Oncorhynchus clarki lewisi*) and fluvial Arctic grayling (*Thymallus arcticus*). Westslope cutthroat trout typically occur in headwater environments in the drainage, while Arctic grayling have been reintroduced in the main stem Ruby River above Ruby Reservoir (Oswald 2000). Neither of these species was captured in Brunzell Slough during this sampling effort.

While presence of a species can be confirmed through collection of one specimen from a stream, absence is difficult to prove. Generally, it takes repeated sampling over time to reliably determine absence. Given the constraints of a one-day fish survey, we sought to maximize the probability of capturing as many species as possible. The reach lengths of greater than 40 channel widths and good spatial coverage of the stream theoretically provides greater than 90% certainty that all species present were represented in the sample.

Although whirling disease has been well documented in the Ruby River watershed, observation of four infected rainbow trout should serve as a reminder to take precautions regarding further spread of this disease. Anyone wading, working, or fishing in this stream and neighboring ponds should clean mud and debris from gear and equipment. In addition, disinfecting gear with a bleach solution may further prevent spread of disease causing organisms. Finally, live fish or fish tissue should not be moved from this site to other drainages.

Literature Cited

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Oswald, R.A. 2000. Inventory and survey of selected stream fisheries of the Red Rock, Ruby, and Beaverhead River drainages of southwest Montana. Montana Department of Fish, Wildlife & Parks. Technical Report.

Reichel, J, and D. Flath. 1995. Identification of Montana's amphibians and reptiles. Montana Outdoors May/June 1995.

Rosgen, D.L 1996. Applied River Morphology. Wildland Hydrology, Pagosa Springs, Colorado.

Appendix A

Raw data for fish sampled in Brunzell Slough on September 21, 2001

Reach	Species	Length	Comments
1	white sucker	6.2	
1	brown trout	11	
1	white sucker	5.3	
1	white sucker	8.4	
1	white sucker	7.1	
1	white sucker	6.2	
1	white sucker	6.4	
1	brook trout	7.1	
1	white sucker	6.8	
1	white sucker	5.7	
1	longnose sucker	4.4	
1	white sucker	7.2	
1	white sucker	6.5	
1	white sucker	5.3	
1	longnose sucker	5.1	
1	white sucker	4.4	
1	white sucker	4.4	
1	mottled sculpin	3.4	
1	mottled sculpin	2.9	
1	mottled sculpin	3.4	
1	white sucker	4.3	
1	white sucker	4.8	
1	white sucker	6.4	
1	longnose sucker	5.6	
1	white sucker	4.2	
1	white sucker	4.8	
1	white sucker	4.9	
1	white sucker	4.6	
1	white sucker	4.4	
1	white sucker	3.2	
1	longnose sucker	2.5	
1	white sucker	2.2	
2	white sucker	5.4	
2	brown trout	7.6	
2	white sucker	5.5	
2	white sucker	4.5	
2	white sucker	4.2	
2	longnose sucker	4.5	
2	longnose sucker	3.7	
2	longnose sucker	4.7	
2	white sucker	5.8	
2	white sucker	4.2	
2	mottled sculpin	3.3	
2	mottled sculpin	3.2	
2	longnose sucker	3.7	

Reach	Species	Length	Comments
2	white sucker	4.8	
2	white sucker	4.4	
2	white sucker	4.6	
2	mottled sculpin	3.1	
2	longnose sucker	5	
2	white sucker	4.2	
2	longnose sucker	4.7	
2	white sucker	4	
2	longnose sucker	3.8	
2	longnose sucker	3	
2	longnose sucker	3.8	
2	longnose sucker	3.2	
2	longnose sucker	2.6	
2	mottled sculpin	1.4	
2	white sucker	1.9	
2	mottled sculpin	1.8	
3	brown trout	4.9	
3	white sucker	4.9	
3	brown trout	4.4	
3	white sucker	2.7	
3	mottled sculpin	2.4	
3	white sucker	2.2	
3	white sucker	2.2	
3	rainbow trout	2.2	Mortality, whirling disease infected fish, collected
3	white sucker	2.7	
3	rainbow trout	2.8	Mortality, whirling disease infected fish, collected
3	white sucker	2.8	
3	white sucker	1.7	
3	rainbow trout	2.6	Mortality, whirling disease infected fish, collected
3	rainbow trout	2.6	Mortality, whirling disease infected fish, collected
3	mottled sculpin	2	
3	white sucker	2.1	
3	mottled sculpin	1.9	